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Carnegie-Mellon University
Software Engineering Institute

Directory of Industry and University Collaborations with a Focus on Software Engineering Education

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Professional Education Project

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The ideas and findings in this report should not be construed as an official DoD position. It is published in the interest of scientific and technical information exchange.

Review and Approval

This report has been reviewed and is approved for publication.

FOR THE COMMANDER

Thomas R. Miller, Lt Col, USAF
SEI Joint Program Office

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Introduction

This directory contains information on collaborative efforts to promote software engineering education, usually within a specific geographic area. It allows the reader to locate an existing group with which to interact, as a potential member, supporting university, or commercial provider of educational services to the group. The directory provides brief descriptions of currently identified collaborations. It is expected that the directory will grow as more such collaborations are formed.

The groups described vary in their maturity and in the type of services provided. Some groups merely share information and experience; others offer software engineering classes to members and non-members for a fee. Obtaining cost-effective education designed to specification and delivered locally is often difficult for a single organization, but when organizations pool resources and share classroom seats, costs go down. A nearby university typically serves as the group facilitator and coordinates class offerings, which may be selected by a refereed process from course proposals solicited by the group members from educational vendors.

For a software organization, the directory provides awareness of geographically convenient collaborations. If none is available locally, the descriptions of existing collaborations may serve as a model for the formation of a local group. The more mature groups are serving as models to emerging groups, providing examples of organization structure, charters, fee arrangements, and other pertinent information.

For colleges and universities, the directory highlights a potential business opportunity and a way to become more involved in the local industrial community. The points of contact from universities are experts in techniques for organizing local efforts.

For educational providers, the directory can point to new potential client bases.

A short list of references is provided to point the reader to background material on software engineering curricula, training needs for organizations embarked on software process improvement efforts, Software Process Improvement Networks (SPINs), and the Software Engineering Institute (SEI) capability maturity model (CMM) and its key process areas (KPAs). These topics are relevant to the discussion of goals of the collaborative efforts.

Geographical Data

The following listing indicates by state where the university/industry collaborations described in this directory are located.

California

District of Columbia

Florida

Texas

Alliance for Higher Education

The Alliance of Higher Education creates partnerships between academic and corporate communities to respond to the educational demands of business, industry, and government and to facilitate cooperative activities. It began its mission in 1967 with a television network, known as TAGER, which brings higher education to the workplace. The Dallas chapter of the Software Process Improvement Network (SPIN), in conjunction with the Association for Software Engineering Excellence (ASEE), is working to provide software engineering education over the TAGER network.

Organization

The Alliance for Higher Education is a not-for-profit non-government agency. It is directed by a Board of Trustees. Presidents and chancellors of member academic institutions provide direction through the Council of Presidents.

Membership

There are 3 categories of membership:

1. *Principal participants* are colleges and universities, currently numbering about 25.

2. *Associate participants* are institutions, agencies, or companies that are substantial users of Alliance services.

3. *Service subscribers* participate in Alliance services.

All membership categories have a membership approval process. There is a fee structure for membership.

Course Acquisition

Influenced by both the Dallas SPIN and SEI curriculum guidelines, Southern Methodist University, Texas Christian University, and The University of Texas at Arlington offered graduate courses in software engineering over the TAGER network in the fall of 1993. The Alliance produces a course catalog.

Point of Contact for Further Information

Dr. Harvey Stone
Executive Director, Education Delivery Services
17103 Preston Road
Lock Box 107, Suite 250
Dallas, Texas 74248-1373
(214) 713-8170
FAX: (214) 713-8209

CSULB Software Engineering Forum for Training

The California State University at Long Beach (CSULB) Software Engineering Forum for Training (SEFT) is a consortium of companies in the Long Beach, Los Angeles, and Orange County areas, formed to provide high-quality, cost-effective training to their employees. Membership in the consortium provides the opportunity to influence and guide the training course content and to obtain reduced costs per course student-day.

Organization

The Software Engineering Forum for Training has an advisory Executive Board composed of member and CSULB representatives. The SEFT Technical Steering Committee, through subcommittees, manages the activities that meet the technical needs of the SEFT, such as curriculum development and course selection. The SEFT Director is part of CSULB Professional Development, University Extension Services. The SEFT has a charter and documented operating plan.

Membership

Three companies, all large aerospace contractors, are currently enrolled in SEFT. Funding of SEFT is provided through the sale of annual memberships. Members have seats on the Executive Board and the Technical Steering Committee, access to training at a reduced cost, public recognition through SEFT advertisements, and CSULB discounts on select non-credit University Extension Services courses.

Course Acquisition

Following a curriculum needs assessment, seminar topics are selected and course descriptions are written. Proposals are solicited from potential instructors. Several course have been delivered. Subject areas of interest include Software Project Planning and Management, Software Configuration Management, Software Metrics, and topics related to software process improvement. Courses are open to the public when space is available. CSULB has extensive mechanisms, such as videoconferencing, for delivering distance education.

Point of Contact for Further Information

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SEFT Program Director
Division of Professional Development
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FAX: (310) 985-7104

Or

Lou Anne Bynum
Director, Professional Development
University Extension Services
California State University at Long Beach
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Long Beach, CA 90840
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DC SPIN Training Group

The Washington, DC, Software Process Improvement Network (SPIN) started a training group in early 1993. This special interest group meets monthly, usually the third Wednesday night of the month, from 7-9 p.m.

Organization

The DC SPIN Training Group has drafted a charter that includes both training and education goals. At the moment the organization is run by a loose association of volunteers. Meetings usually feature speakers who share information about their organizations' training programs, recap pertinent presentations from national conferences, or describe available training.

Membership

Members are drawn from the DC SPIN. There are approximately 40 members. Attendance at meetings ranges from 10 to 15 people. Individuals may request that they be added to the training group mailing list to receive announcements and minutes of the meetings.

Course Acquisition

To date the DC SPIN Training Group has not acquired any classes for its members. It did however provide students for a pilot offering of an SEI course.

Point of Contact for Further Information

Claire Lohr
President, Lohr Systems
P.O. Box 7099
Reston, VA 22091
(703) 391-9007
FAX: (703) 391-9635

Florida Atlantic University

Florida Atlantic University (FAU) Computer Science and Engineering (CS&E) Department and members of its Industry Advisory Committee recognized a need to establish an extensive graduate education effort in software engineering. Through a combination of SEI-produced video presentations and FAU-produced live lectures, a series of 6 graduate-level software engineering courses was offered consecutively at 6 university and industry sites in southeast Florida during 1990 and 1991, and in a limited fashion until April 1993. The courses were fully funded by the participating industries. On January 16, 1992, 59 students were awarded certificates in software engineering for successfully completing at least 5 of the 6 courses. By the spring 1993 term, over 250 students had taken at least one course.

Organization

The FAU CS&E Department formed an Industry Advisory Committee to help the department identify and meet the needs of the large computing-based industry in southeast Florida. During the advisory committee's initial meetings, the need for extensive graduate software engineering courses for employees quickly emerged as the top issue. While FAU offered software engineering courses as part of its graduate programs, it was not prepared to offer the variety and number of courses needed immediately without more financial assistance and more faculty. FAU contracted with the SEI to obtain a set of video-based courses, to be delivered by FAU faculty.

Membership

Nine research and development firms having headquarters or major plants in southeast Florida were invited to join the FAU CS&E Department Industry Advisory Committee: Bendix King, Encore Computer Corporation, Harris, IBM, Modular Computer Systems, Motorola, Siemens Stronberg-Carlson, Racal Datacom, and United Technologies. These companies fully funded the courses.

Course Acquisition

The courses taught were: Software Project Management, Software Verification and Validation, Software Design, Software Creation and Maintenance, Software Specification, and Software Systems.

Point of Contact for Further Information

Neal S. Coulter
Computer Science and Engineering Department
Florida Atlantic University
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neal@cse.fau.edu

Research Institute for Computing and Information Systems (RICIS)

The mission of RICIS is to conduct, coordinate, and disseminate research in computing and information systems to serve the needs of government, academia, industry, and community. Emphasized research areas include: software reuse, group decision support methodology, mission- and safety-critical systems, and medical imaging. New projects are being formed in digital libraries, environmental computing, and network information resources. Special emphasis is placed on design and execution of symposia, projects, and interchanges to facilitate technology transfer among the RICIS participants.

Organization

The University of Houston at Clear Lake (UHCL) established RICIS in 1986 to encourage NASA Johnson Space Center (JSC) and local industry to actively support research in computing and information systems. A cooperative agreement between UHCL and NASA/JSC provides for sharing of personnel and of computing and educational facilities. The RICIS Program Office, within the UHCL Provost Office, manages funding from various sources, primarily from NASA under the cooperative agreement. The overall organization is that of collaborative projects within the above broad research areas.

Membership

RICIS encourages faculty participation across UHCL schools: Natural and Applied Sciences, Business and Public Administration, Human Sciences and Humanities, and Education. An Industrial Affiliates program involves local companies (led by Rockwell, Lockheed, UNISYS, McDonnell Douglas, Loral/IBM, and Texaco) in defining research problems in systems engineering and project management. A gateway concept expands the local expertise on targeted problems to include vendors, other universities, and other research organizations. Fees are charged only for direct participation in projects.

Course Acquisition

Courses and special events are organized in conjunction with the UHCL Professional and Continuing Education unit. A Master of Software Engineering degree program is offered within the Computer Science Program. Related programs are available in business administration, futures studies, and instructional technology, among others. Further description of the Institute, its research areas (especially the NASA Repository Based Software Engineering Project), and the Master of Software Engineering Program are available on Internet/World Wide Web currently at http://rbse.jsc.nasa.gov.

Point of Contact for Further Information

Dr. Susan L. Gerhart
Director, RICIS
University of Houston-Clear Lake
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FAX: (713) 283-3810

SDSU Software Engineering Forum

The San Diego State University (SDSU) Software Engineering Forum (SEF) is a partnership of San Diego industry, corporations, interested government organizations, and SDSU. The Forum is a self-supporting unit that draws on existing activities and resources provided by local business, government, and SDSU. The Software Engineering Forum promotes high quality, cost-effective training in Software Engineering and management practices. The purpose of this training is to empower members to build and implement a process infrastructure for effective Software Engineering and management practices to support the goal of achieving higher software process maturity levels as defined by the Software Engineering Institute (SEI) of Carnegie Mellon University (from the *SEF Handbook*, January 25, 1993).

Organization

The SEF has an advisory Executive Board composed of member and SDSU representatives. The SEF Technical Steering Committee, through subcommittees, manages the activities that meet the technical needs of the SEF such as curriculum development and course selection. The SEF Director is part of SDSU Professional Development, College of Extended Studies. The SEF has a charter and documented operating plan.

Membership

Thirteen companies are currently enrolled in SEF. Most are Department of Defense contractors; some very large, some very small. Funding of SEF is provided through the sale of annual memberships. The level of membership determines the membership fee and the annual seat allocation in SEF course offerings.

Course Acquisition

Following a curriculum needs assessment, seminar topics are selected and course descriptions are written. Proposals are solicited from potential instructors. Since 1992, 20 courses have been delivered. Courses are open to non-members for a fee.

Point of Contact for Further Information

Lesley Norris
San Diego State University
CES/PD (SEF)
5300 Campanile Drive
San Diego, CA 92115-9980
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USC Center for Software Engineering

The University of Southern California (USC) Center for Software Engineering (CSE) has been formed to help address the need for more mature software engineering organizations to meet the demand for complex software systems of the future. "Its bottom-line objective is to improve the long-range state of software enineering practice by catalyzing a new generation of software engineering courseware and delivery capabilities. Its 10-year strategy for achieving this objective involves a combination of sustained programs in software engineering education, research, and technology transition." (from the *Prospectus for the USC Center for Software Engineering Affiliates' Program*, December 1992)

Organization

The USC Center for Software Engineering takes a multifaceted approach to improving the state of software engineering practice. It performs necessary gap-filling research in such areas as knowledge-based software engineering, environments, processes, architectures, and economics. In Fall 1993 it initiated an MS in Computer Science with a software engineering specialization. It has plans to develop textbooks, videos, computer models, games, tools, exercises, and role-model artifacts for training the next generation of software engineers. The USC Center for Software Engineering has an affiliates program with an active Affiliates' Steering Committee. The CSE Director is part of the USC Computer Science Department; the Center principals include USC professors in electrical engineering and business, and professors at the USC Information Sciences Institute.

Membership

Industry and government affiliates are a key aspect of the CSE. Through payment of an annual membership fee, affiliates acquire a seat on the Center Affiliates' Steering Committee. Center personnel provide an annual one-day visit to the affiliate organization, involving a professor and an agenda of the affiliate's choice. Affiliates participate in focused workshops, executive software seminars, and an annual software engineering conference and monthly Software Process Improvement Network (SPIN) meetings in collaboration with University of California Irvine. Affiliates receive prototype tools for experimentation, technical reports, and exploratory videos and courseware. There are currently 19 affiliate organizations.

Course Acquisition

While the Center does not produce courses specifically for affiliates, member organizations benefit from annual one-day USC professor lectures/visits to the affiliate's organization. Peroidic focused workshops provide the opportunity for technical interchange among professors, researchers, and practitioners. Most of the software engineering MS courses are offered on a regional interactive television network; some of the courses are also offered nationally by National Technological University.

Point of Contact for Further Information

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